

SWITCHING CIRCUIT TO REDUCE SENSING
CURRENT DUTY CYCLE
(CRC CIRCUIT)

FIG.1 PRIOR ART

SENSING PULSE & LOAD WAVEFORMS PRODUCED BY ORIGINAL CRC DESCRIBED IN PATENT NUMBER 6,100,510 (DATA TAKEN ACROSS R4 +RH)

- SENSING PULSE BEGINS AT OR NEAR ZERO CROSS AND ENDS AT OR BEFORE 60°
16.6 millisecond SAMPLING RATE FOR 60 CYCLE AC SUPPLY

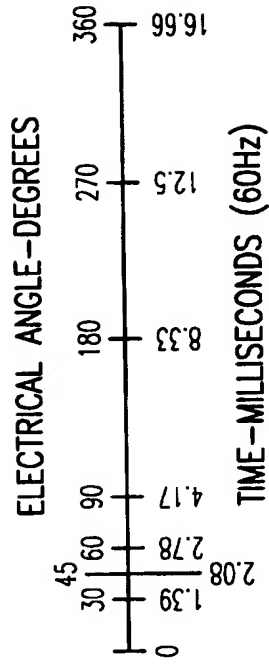
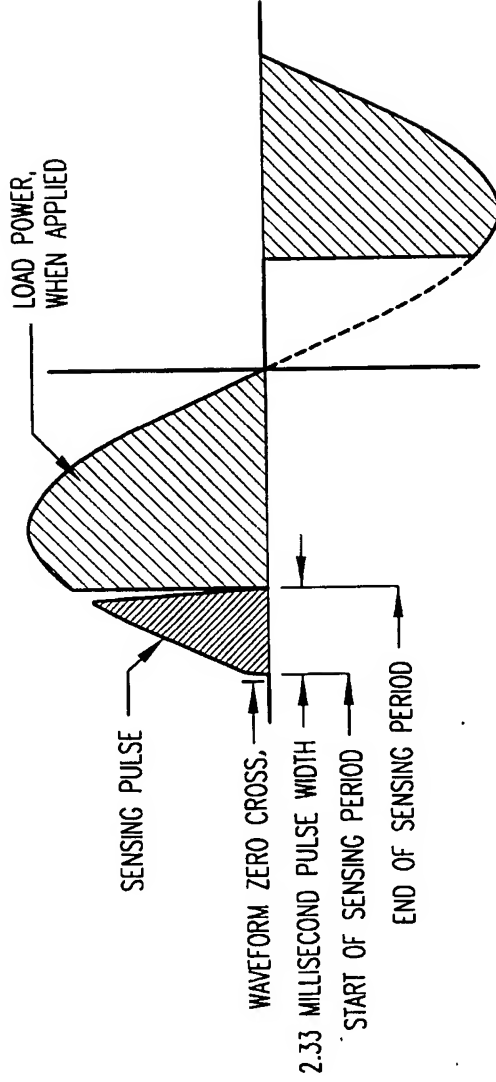


FIG.2 PRIOR ART

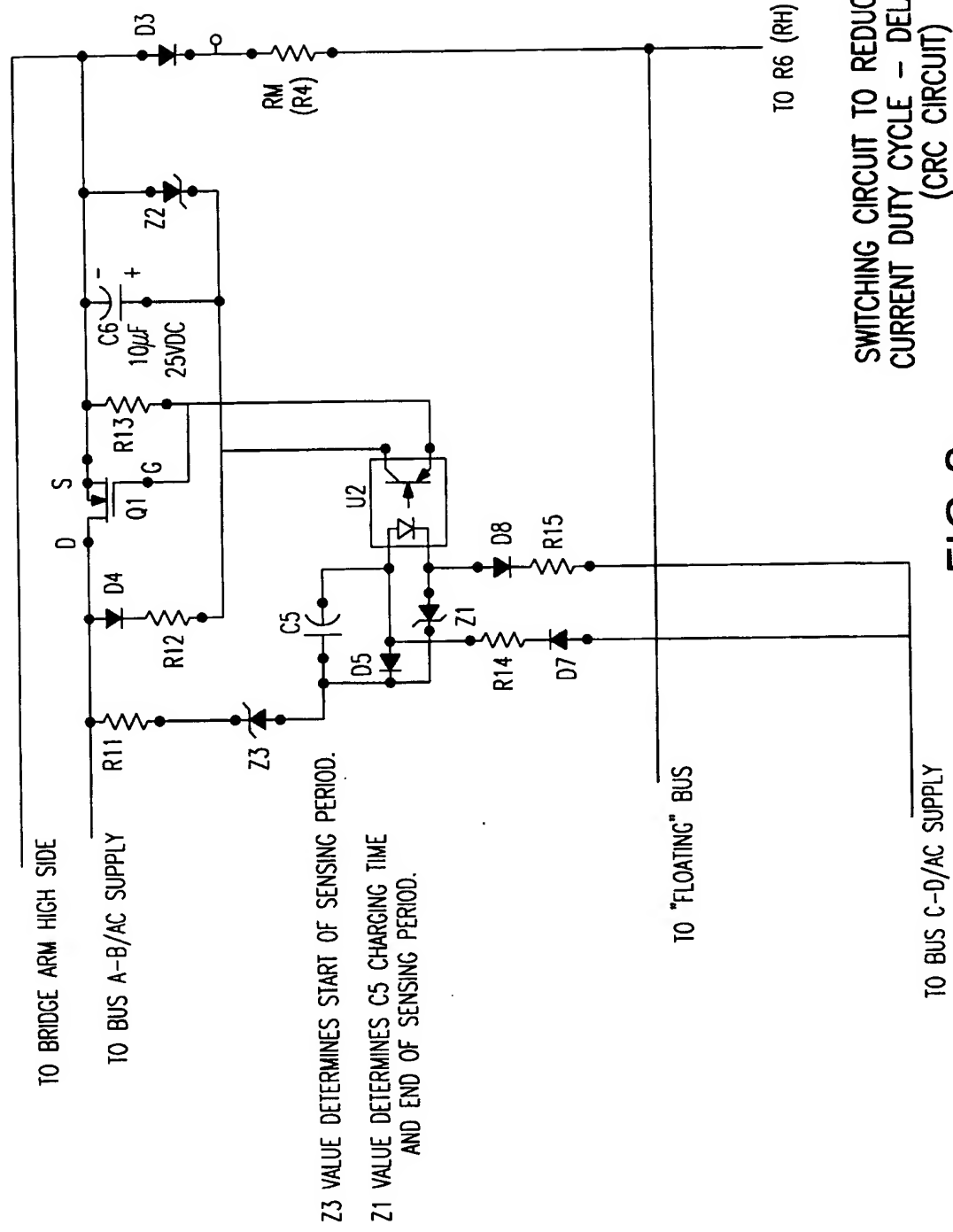


FIG. 3

DELAYED START SENSING PULSE & LOAD WAVEFORMS

- SENSING PULSE BEGINS BEYOND ZERO CROSS AND ENDS AT OR BEFORE 60°
16.6 millisecond SAMPLING RATE FOR 60 CYCLE AC SUPPLY

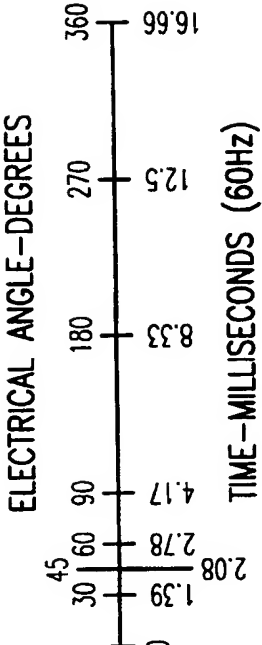
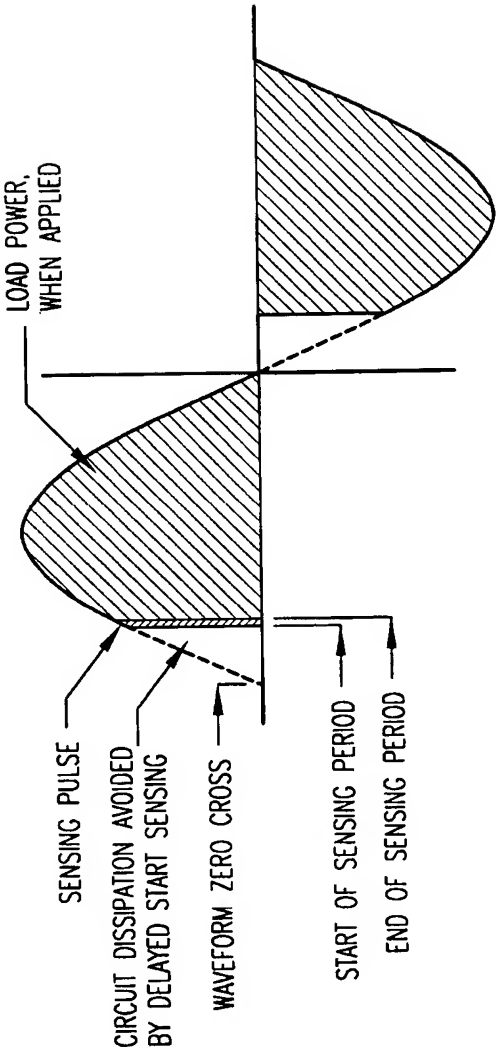


FIG.4

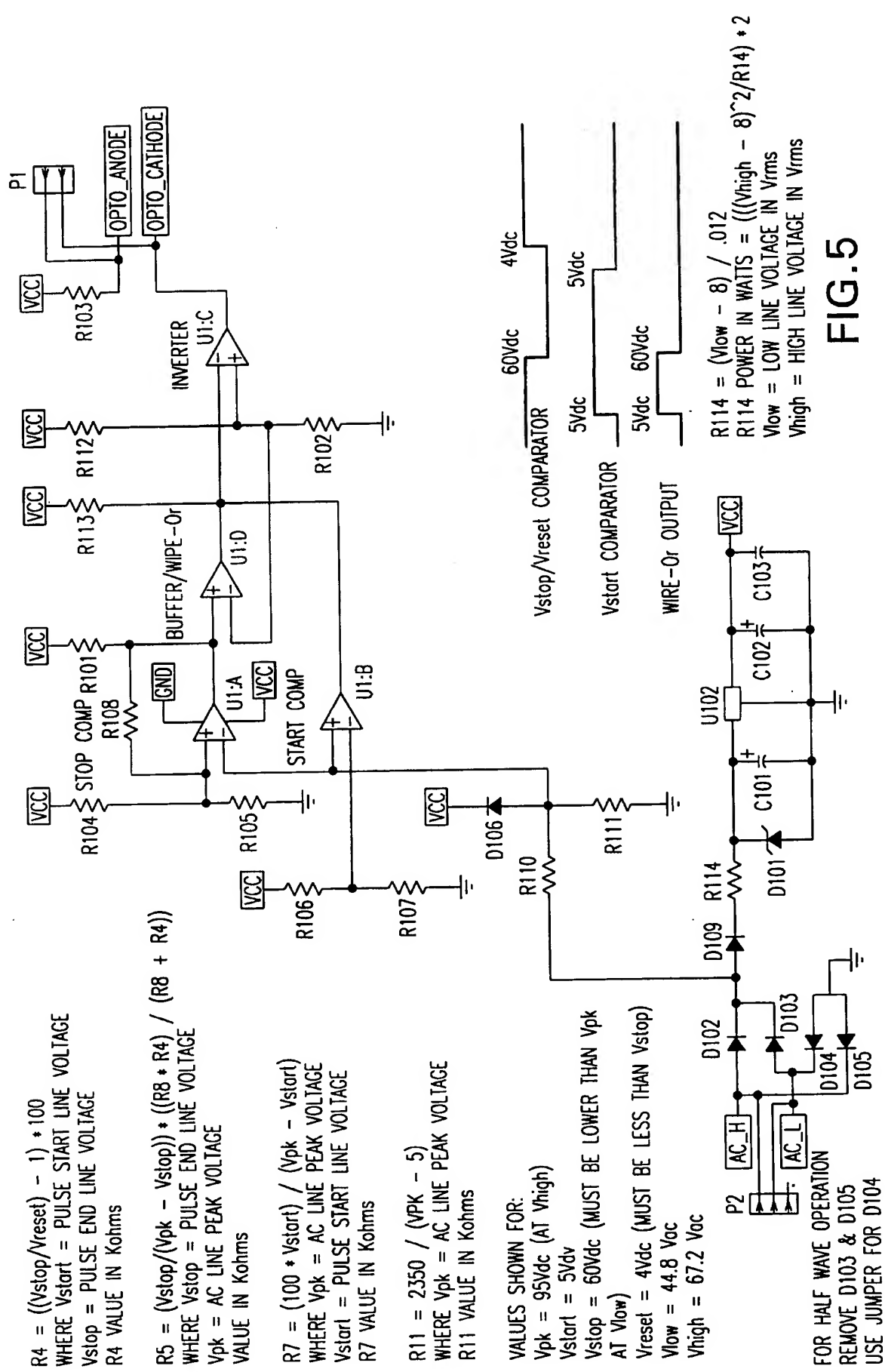
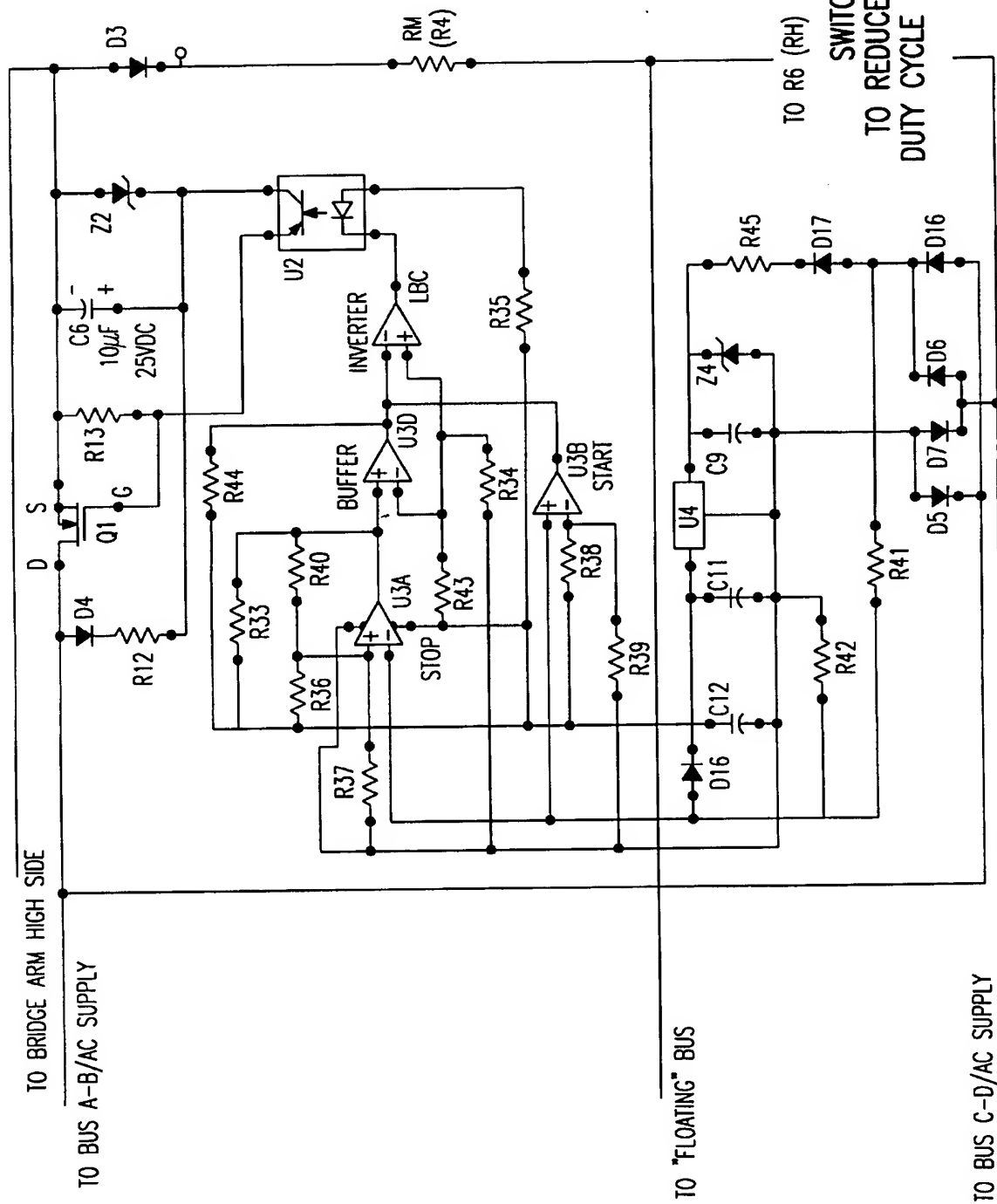


FIG.5



SWITCHING CIRCUIT
TO REDUCE SENSING CURRENT
DUTY CYCLE - QUAD COMPARATOR
CIRCUIT FIG.6

DELAYED START SENSING PULSE & LOAD WAVEFORMS

- SENSING PULSE BEGINS BEYOND ZERO CROSS AND ENDS AT OR BEFORE 60° WHEN OPERATING AT DESIGN VOLTAGE
8.33 millisecond SAMPLING RATE FOR 120 CYCLE PULSATING DC SUPPLY (RECTIFIED 60 Hz AC)

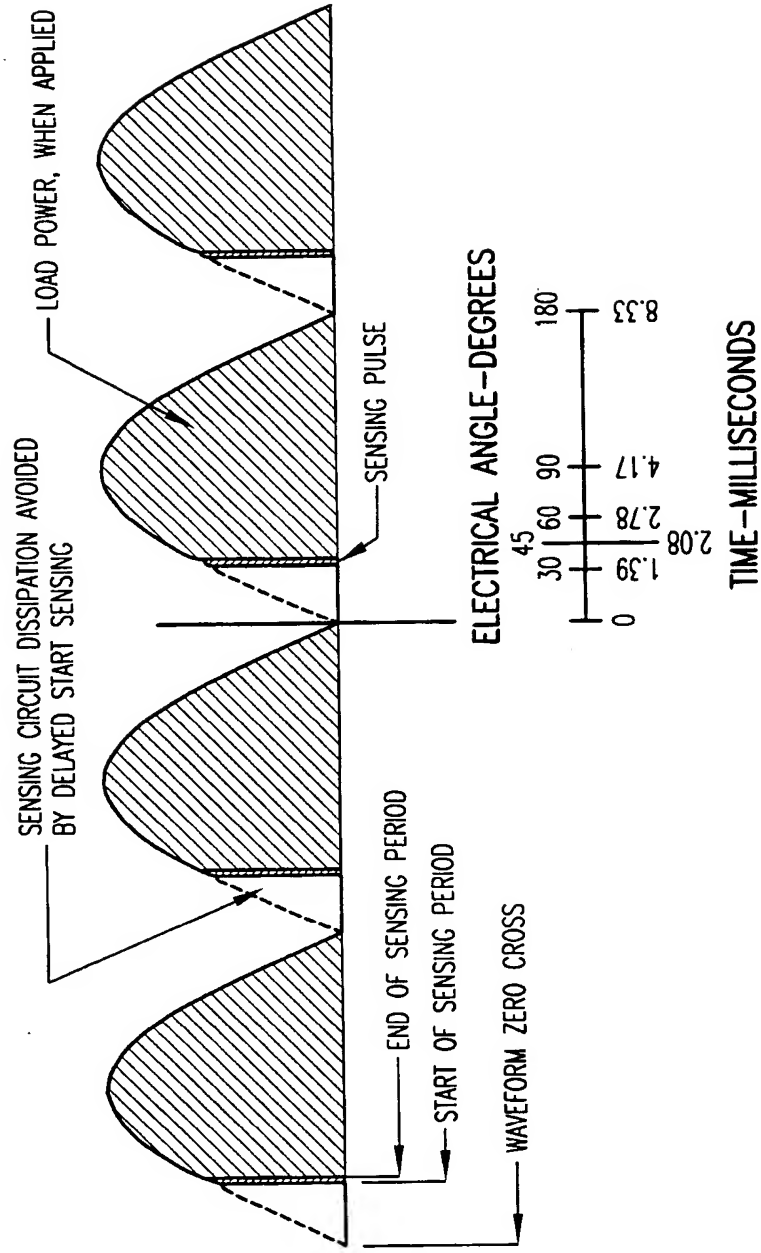


FIG. 7

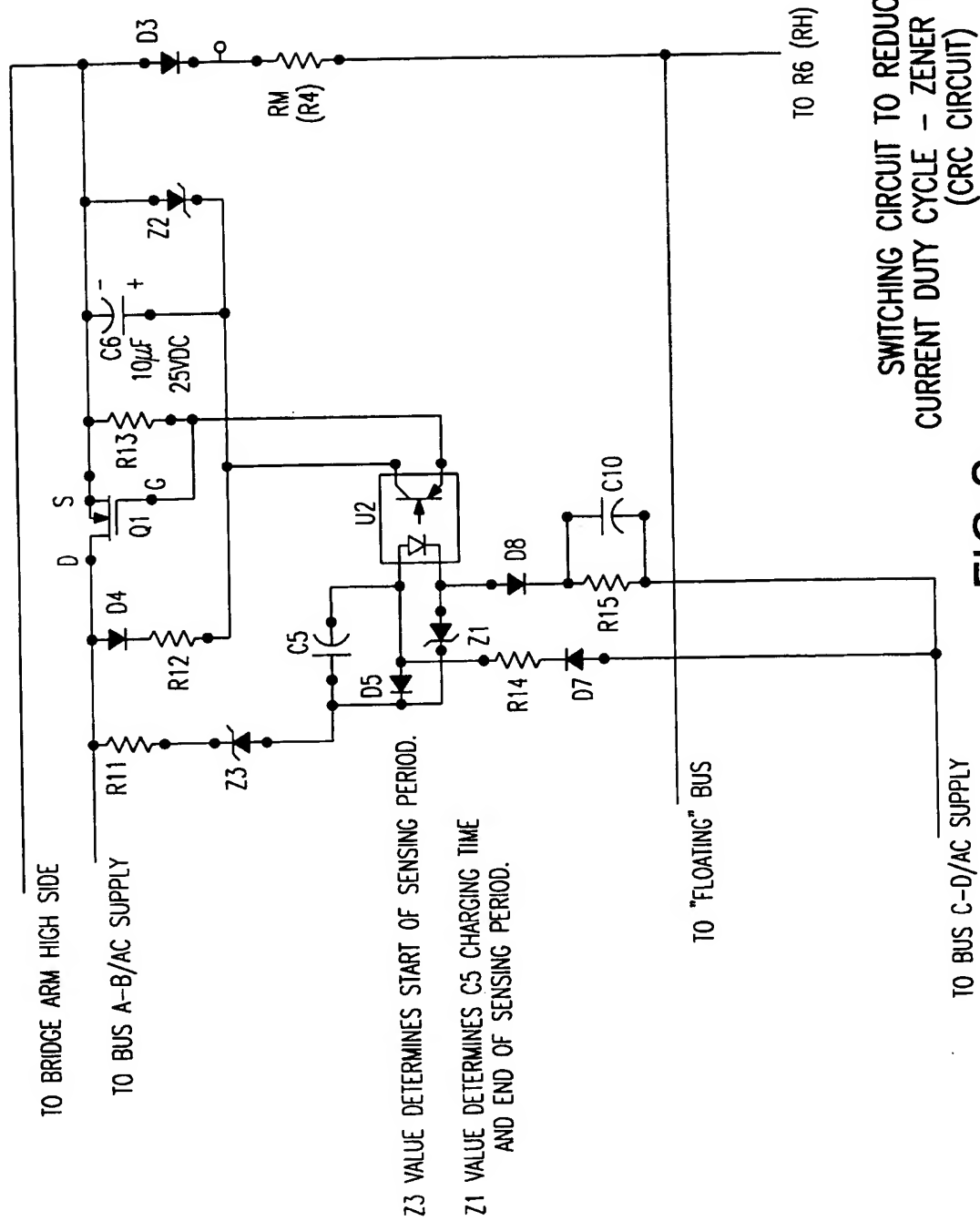
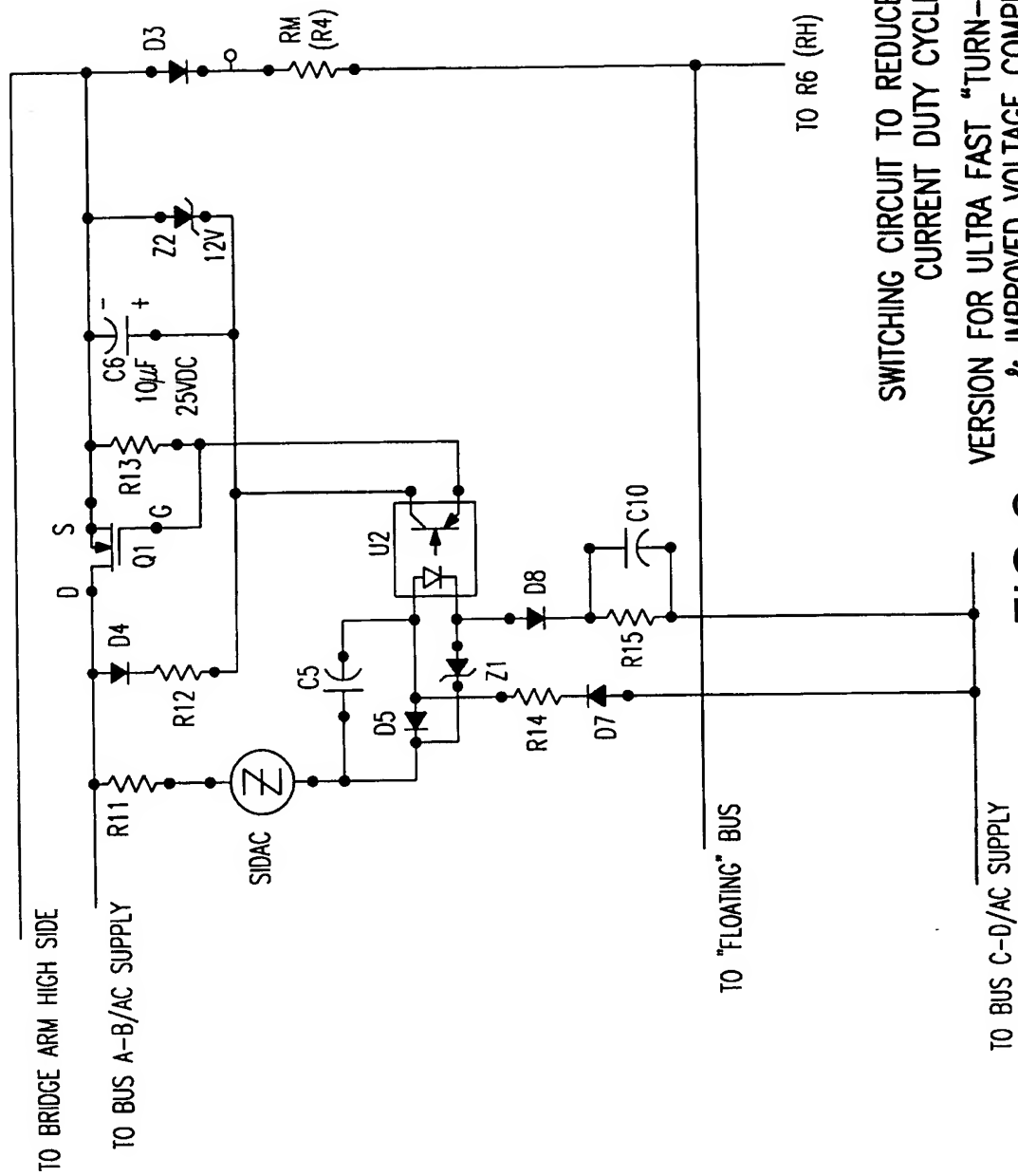


FIG.8



SWITCHING CIRCUIT TO REDUCE SENSING CURRENT DUTY CYCLE VERSION FOR ULTRA FAST "TURN-ON" SWITCHING & IMPROVED VOLTAGE COMPENSATION

DELAYED START SENSING PULSE & LOAD WAVEFORMS -CONTROLLED SLOPE LEADING AND TRAILING PULSE EDGE SWITCHING SHOWN

- SENSING PULSE BEGINS BEYOND ZERO CROSS AND ENDS AT OR BEFORE 60° AT DESIGN VOLTAGE
 16.6 millisecond SAMPLING RATE FOR 60 CYCLE AC SUPPLY

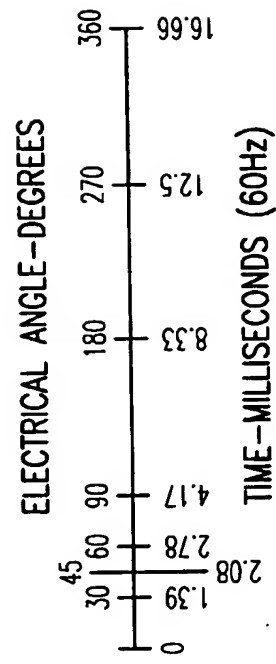
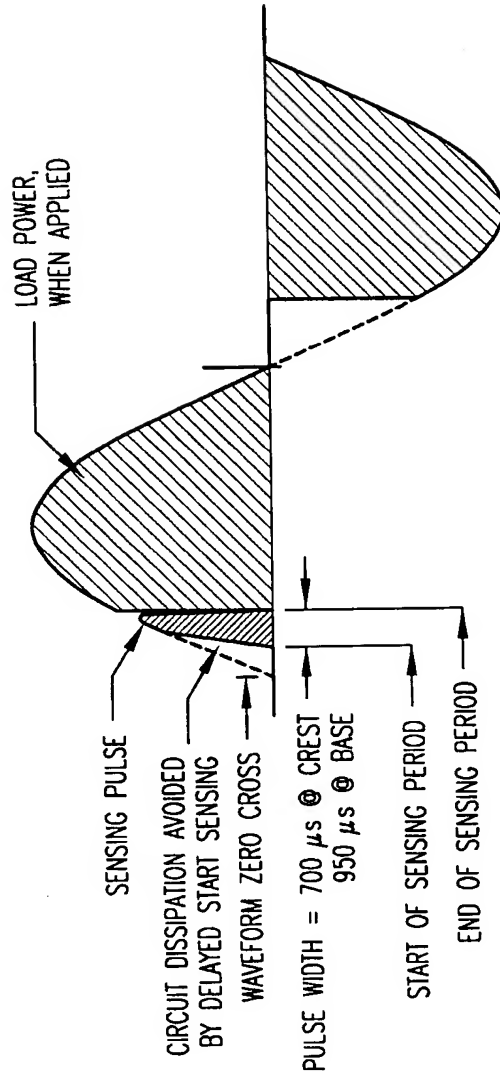


FIG.10

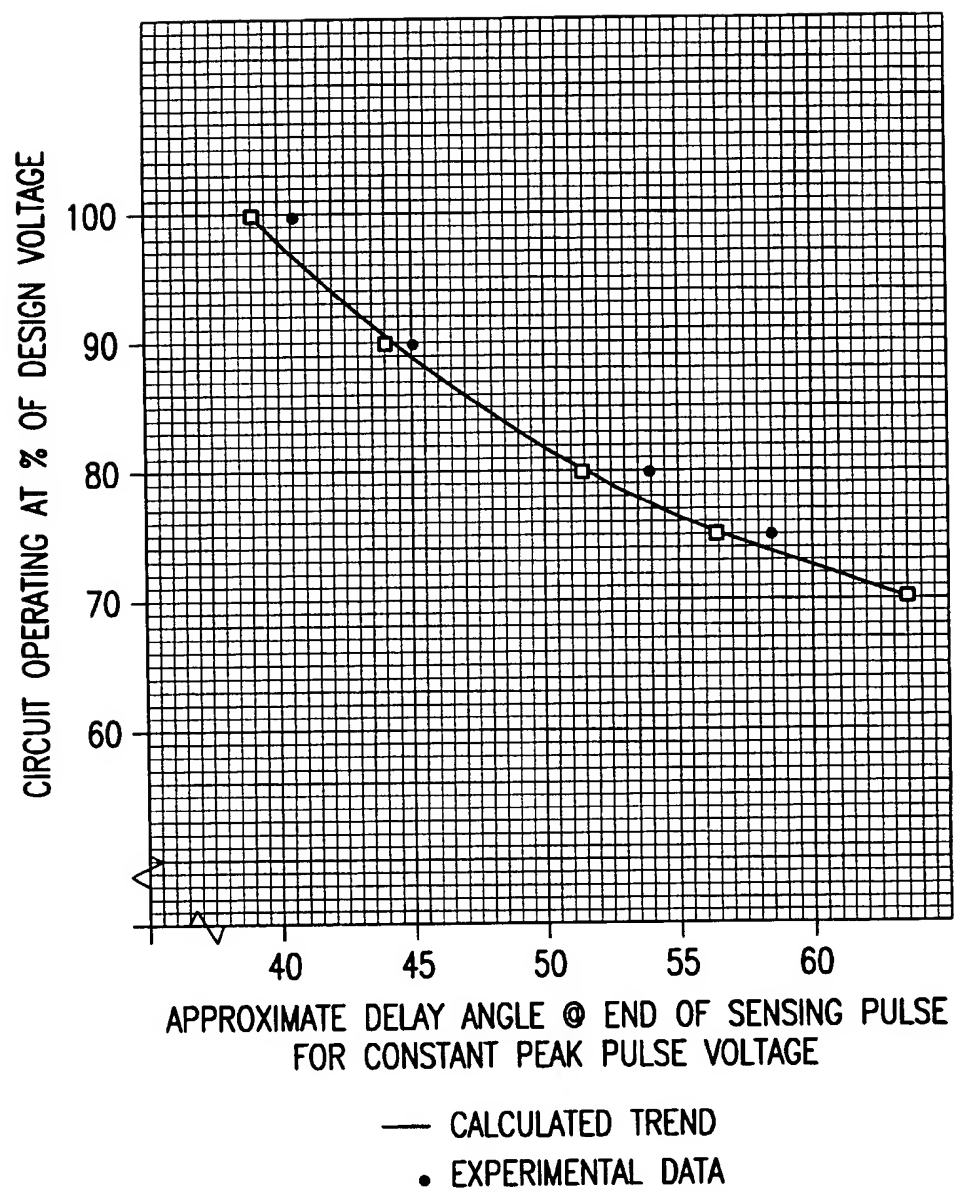


FIG.11

DELAYED START SENSING PULSE & LOAD WAVEFORMS -100% DESIGN VOLTAGE NOMINAL 200 μ s PULSE WIDTH SHOWN

- SENSING PULSE BEGINS BEYOND ZERO CROSS AND ENDS AT OR BEFORE 60° WHEN OPERATING AT DESIGN VOLTAGE
 16.6 millisecond SAMPLING RATE FOR 60 CYCLE AC SUPPLY

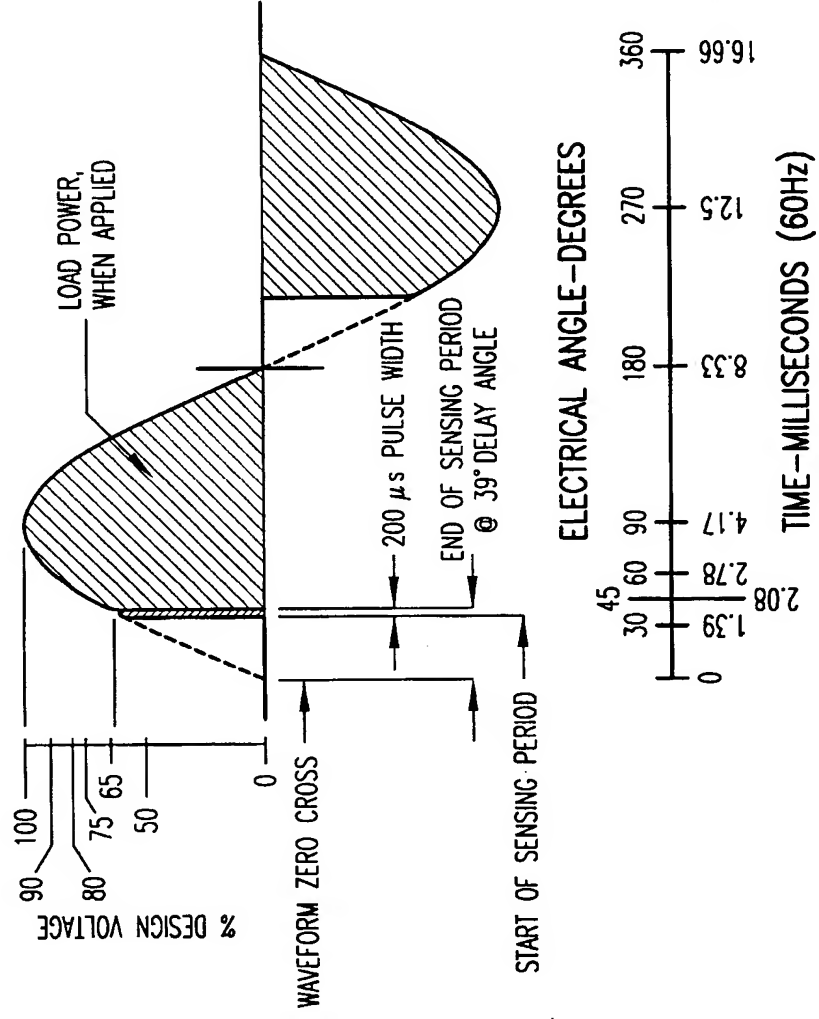


FIG.12

DELAYED START SENSING PULSE & LOAD WAVEFORMS -90% DESIGN VOLTAGE -NOMINAL 200 μ s PULSE WIDTH SHOWN

- SENSING PULSE BEGINS BEYOND ZERO CROSS AND ENDS AT OR BEFORE 60° AT DESIGN VOLTAGE
 16.6 millisecond SAMPLING RATE FOR 60 CYCLE AC SUPPLY

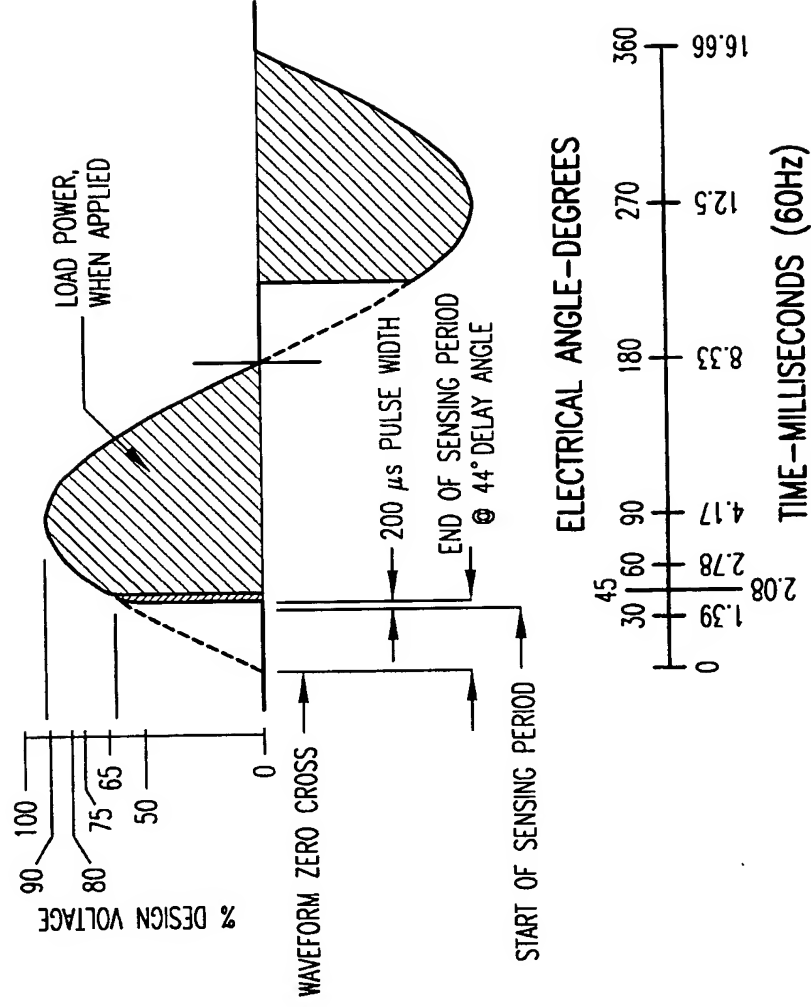


FIG.13

DELAYED START SENSING PULSE & LOAD WAVEFORMS -80% DESIGN VOLTAGE -NOMINAL 200 μ s PULSE WIDTH SHOWN

- SENSING PULSE BEGINS BEYOND ZERO CROSS AND ENDS AT OR BEFORE 60° AT DESIGN VOLTAGE
16.6 millisecond SAMPLING RATE FOR 60 CYCLE AC SUPPLY

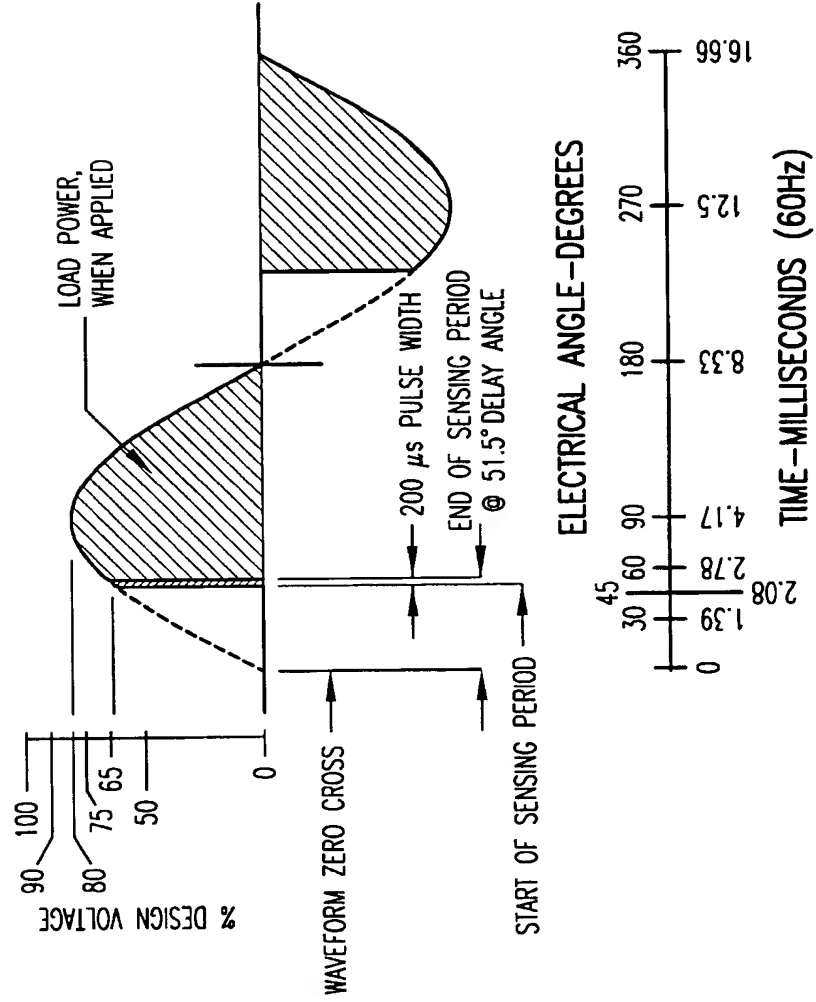


FIG.14

DELAYED START SENSING PULSE & LOAD WAVEFORMS -75% DESIGN VOLTAGE -NOMINAL 200 μ s PULSE WIDTH SHOWN

- SENSING PULSE BEGINS BEYOND ZERO CROSS AND ENDS AT OR BEFORE 60° AT DESIGN VOLTAGE
 16.6 millisecond SAMPLING RATE FOR 60 CYCLE AC SUPPLY

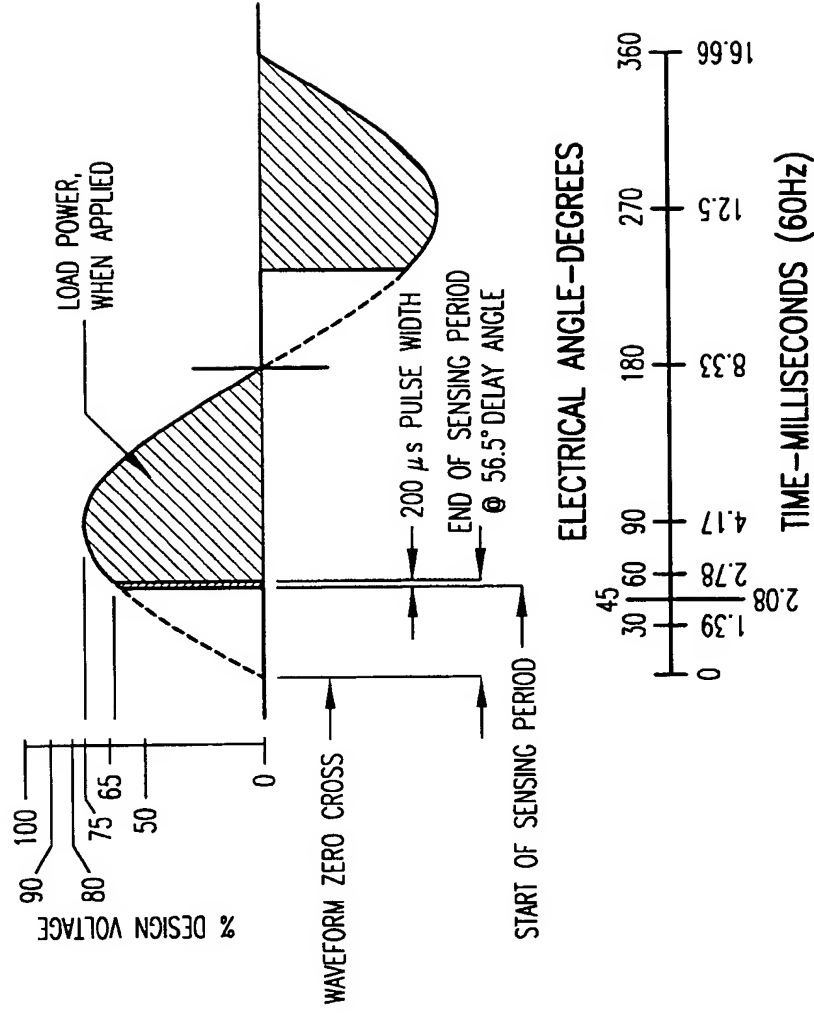


FIG.15

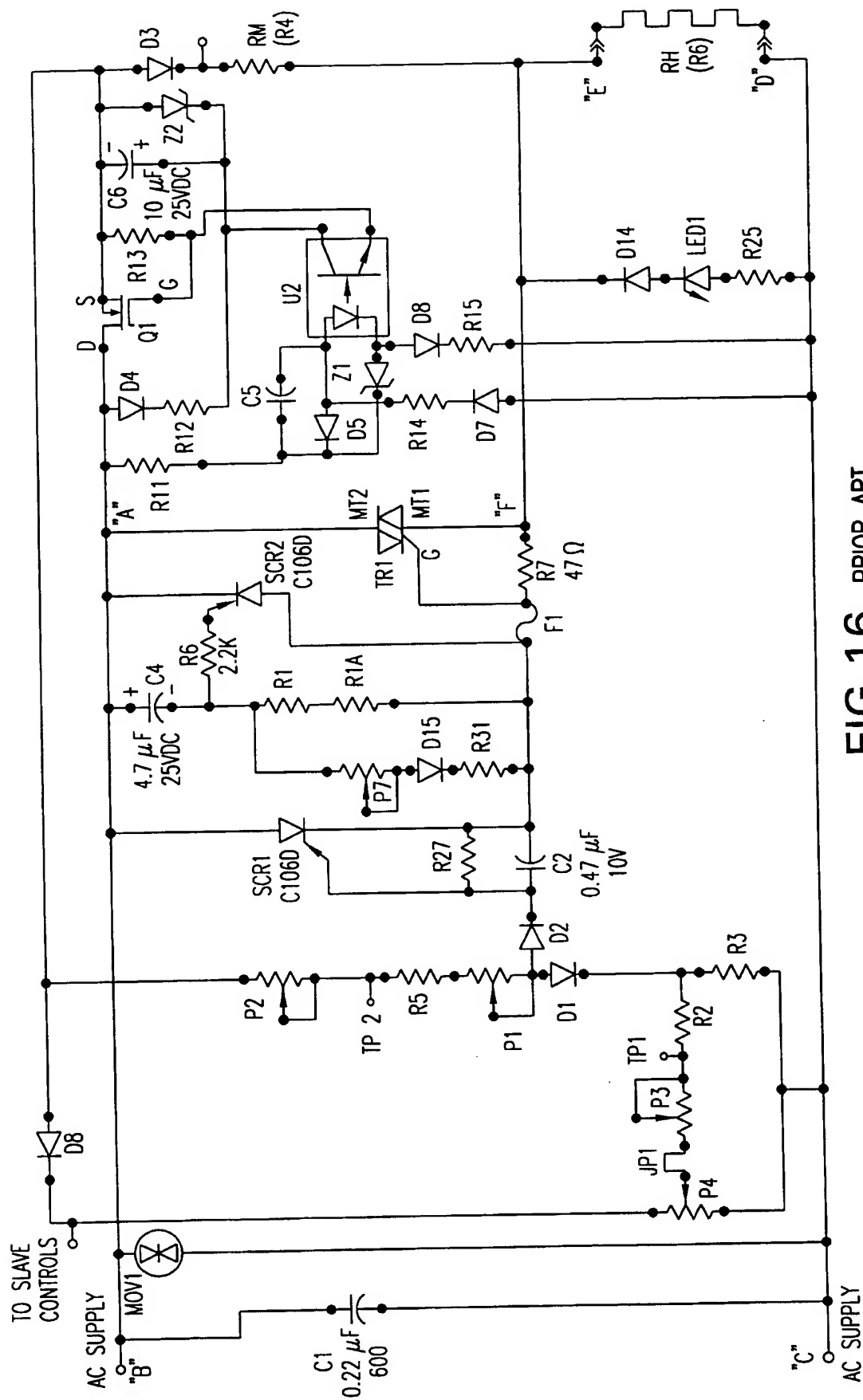


FIG.16 PRIOR ART